Abstract

Energy consumption is one of the most important performance metrics for wireless ad hoc networks because it directly relates to the operational lifetime of the network. Based on this thought, in this article we will establish an ad-hoc network where the power consumption during transmission can be controlled. To minimize the total energy consumption, we have adopted a simple network layer/routing model that serves as a benchmark for performance evaluation. Herein we have worked with the mesh topology, and each nodes of the network are substituted using directional antenna. The four directional antennas are used to represent each node. When a node needs to send information to others it only enables its particular sector or sectors through which it is connected to those nodes. We have also replaced the nodes in the network with sectors and found that the total energy consumed by the network is much less. We devised an algorithm to find the average dominating set without varying the radius of the network. Also, we found the minimum dominating set within a graph by varying the number of nodes only i.e. the density of the graphs. After establishing our own set of algorithm to find the minimum dominating set in a network, it is compared with Dai & Wu’s Algorithm. We believe by using such a generic model, with special added advantages, we will succeed in meeting our goal.
- Shuhui Yan, Jie Wu, and Fei Dai, Efficient Directional Network Backbone Construction in Mobile Ad Hoc Networks, Department of Computer Science, Rensselaer Polytechnic Institute Troy, NY 12180.  
- An Extended Localized Algorithm for Connected Dominating Set Formation in Ad Hoc Wireless Networks by Fei Dai, Student Member, IEEE, and Jie Wu, Senior Member, IEEE.

**Index Terms**

Computer Science  
Wireless

**Keywords**

Connected Dominating Set (CDS)  
Directional Antenna (DA)  
Dominating Sector (DS)  
Energy Efficient Routing (EER)  
Minimal Dominating Node Selection (MDNS) and Minimal Connected Dominating Set (MCDS)